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Effectiveness of Locally Made Scouring Powder Produced Using Eggshell

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ABSTRACT

This study focused on the effectiveness of locally made scouring powder produced using eggshell. The eggshells are washed to ensure the end product is free of dirt. It was dried and grinded into powder. The ground eggshells were mixed with regular table salt, detergent, baking soda, borax, dried rosemary, essential oil in the right proportion. Results showed that the locally produced scouring powder using eggshell was effective in washing pots clean, washing bathroom tiles, easy to make and use, saves cost and is good for the environment. It is recommended that awareness campaigns, workshops, and seminars should be organized by government and organization to educate people on the benefits of this scouring powder.

Keywords: Eggshell, formulation, calcium carbonate, scouring powder, household cleaning

INTRODUCTION

In an ideal scenario, households should have access to affordable and effective cleaning products. Conventional cleaning products have become increasingly expensive, pushing consumers, to explore cheaper alternatives. This has paved the way for the emergence of "do it yourself" (DIY) cleaning solutions utilizing readily available and affordable materials. However, in Nigeria, the high rate of inflation and cost of living have led many citizens to seek alternative solutions to meet their household needs. One such solution gaining popularity is the use of locally made scouring powder using eggshells.

In Nigeria, where eggs are a common household item, the idea of repurposing eggshells for cleaning purposes has gained traction. Eggshells, known for their abrasive properties, can effectively

remove stains and grime from various surfaces when ground into a fine powder. When combined with other household ingredients like baking soda or vinegar, eggshell scouring powder can rival commercially available products in terms of effectiveness. The potential of locally made scouring powder using eggshells as an avenue for self-reliance cannot be over-emphasized. Continued reliance on commercial cleaning products could exacerbate financial burdens on families, particularly in economic challenges.

Existing studies have primarily focused on the economic aspects of poultry egg production [1] and the broader environmental challenges facing Nigeria [2]. Furthermore, socio-economic determinants influencing household consumption patterns of detergents have been explored [3]. Therefore, there is need to create an awareness on the effectiveness of locally made scouring powder using eggshell.

Eggshell powder, derived from the outer shells of eggs, possesses several properties that make it a versatile and useful material in various applications. Firstly, eggshells are composed primarily of calcium carbonate, which gives them abrasive properties ideal for cleaning and scouring surfaces [4]. This abrasive nature allows eggshell powder to effectively remove dirt, stains, and grease without causing damage to most surfaces. Furthermore, eggshell powder is rich in calcium, which makes it beneficial for use in agricultural applications as a soil amendment or fertilizer [5]. The slow release of calcium from eggshells helps improve soil pH, structure, and nutrient availability, promoting plant growth and health. Additionally, eggshell powder exhibits absorbent properties, making it suitable for various industrial and environmental applications such as wastewater treatment and heavy metal remediation [5]. The porous structure of eggshells allows them to adsorb and remove contaminants from aqueous solutions efficiently. The unique combination of abrasive, nutrient-rich, and absorbent properties make eggshell powder a valuable resource with diverse applications in cleaning, agriculture, and environmental remediation.

Eggshell powder can be utilized in various household applications, including cleaning and polishing. The abrasive nature of eggshells makes them effective for scouring and removing tough stains from surfaces such as sinks, pots, pans, tiles, toilets, kettles, and other kitchen utensils [4]. When combined with other ingredients such as vinegar or baking soda, eggshell powder can create homemade cleaning solutions that are cost-effective and environmentally friendly.

Repurposing eggshells into powder helps reduce waste and promote sustainable waste management practices. Instead of discarding eggshells as trash, they can be collected, cleaned, and crushed into powder for reuse in gardening, agriculture, or household cleaning [5]. This minimizes the burden on landfills and conserves valuable resources.

Despite the rising cost of living and the increasing demand for affordable household cleaning products, there is limited empirical research on the perception and effectiveness of locally made scouring powder using eggshells. This lack of research hampers the understanding of the feasibility and acceptance of alternative cleaning solutions in resource-constrained environments. These studies overlook the unique context of educational institutions and the potential role of students in promoting self-reliant cleaning practices.

Therefore, the lack of research on the perception locally made scouring powder using eggshells represents a significant gap in the literature. To address this problem, this research work is carried out to investigate the effectiveness of locally made scouring powder using eggshells.

The objectives of this study is to:

1. Collect eggshell locally from the environment
2. Grind these local sourced eggshell
3. To prepare a scouring powder
4. To test for its efficiency

MATERIALS AND METHODS

The major materials used and their functions include,

- Regular table salt, for an abrasive cleaner
- Detergent, lowers the surface tension of water, enabling it to penetrate and lift dirt and grime from surface as well as suspending the loosened dirt particles for easy rinsing.
- Baking soda, acts as a mild abrasive, helping to scrub away dirt and grime and also aa a deodorizer, absorbing unpleasant odors.
- Borax (sodium tetraborate), for a thorough clean. Borax is a natural mineral that can enhance the cleaning power of your powder. It helps lift off stubborn soap scum or residue, making it great to use in homemade scouring powders. Borax also works well to remove strong odors.
- Dried powdered rosemary, for a gentle cleanser. Dried herbs help to clean and disinfect surfaces. They also add smell and strength to the cleaner. Other eexamples of usable herbs are lavender, lemon and orange zest. Dried, organic herbs are preferable
- Essential oil, for aromatherapy. Essential oils have good smell and help to clean tough stains.

To make the powder, baking soda is used as base. Then, other ingredients such as herbs, borax, and essential oils, are added depending on personal cleaning preference.

The production process

The eggshells are washed to ensure the end product is free of dirt. The clean eggshells are dried to make powdering easy. This is done by sun drying or with low heat from an oven to make drying

quicker. The eggshell are converted into powder by pounding with mortar and pestle, or using blender or any other grinding device.

About 1000 g of the pounded or blended eggshells are weighed and carefully poured into a dry container (plastic bowel of about 3 L)

Addition of other ingredients follows: Regular table salt (500 g), and 250 g of detergent were both added and mixed with dry wooden spoon. After thorough stirring for about a minute, 500 g of baking soda, two table spoonful of borax (about 28.8 g), two table spoonful of dried rosemary were added. Mixing continued to ensure a homogeneous mixture. Then, 10 drops of essential oil were added. All the ingredients were blended to get effective scouring powder.

Testing of the produced scouring powder

To test the effectiveness and properties of the locally produced scouring powder, a panel assessed the product and reported their observation.

RESULTS AND DISCUSSION

The following were observed on the scouring powder prepared with eggshells:

a. Abrasive action: it physically scrubs away dirt and grime
b. Cleaning power: it effectively removes tough stains and other stubborn stains from various surfaces.
c. Disinfecting: it also kills germs and bacteria on the surface where it is being applied.
d. Fragrance: it also exhibits a pleasant fragrance to leave the surface smelling fresh.
e. Environmentally friendly: its usage was also found out to minimize harm to the environment.

The locally produced scouring powder using eggshell was observed to be effective in washing pots clean, washing bathroom tiles, easy to make and use, saves cost and is good for the environment. These findings are in line with the work of Olajide [7], who demonstrated that natural materials such as eggshells could serve as effective abrasive agents in household cleaning. Similarly, Adeoye [5] showed that natural scouring powders, when properly formulated, could match the cleaning strength of commercial alternatives. Also on the environmental benefits, Chukwuma [8], noted that natural and biodegradable products like eggshell-based scouring powders reduce environmental waste and chemical pollution.

CONCLUSION

The study revealed the effectiveness of locally made scouring powder produced using eggshell on cleaning kitchen utensils. It was cheap to produce and easy to use.

Recommendations

1. It is recommended that awareness campaigns, workshops, and seminars should be organized by government and organization to educate people on the benefits of this scouring powered.
2. The institutions of learning should integrate the production and use of locally made scouring powder, particularly using eggshells, into practical courses such as Home Economics and Chemistry.
3. Since its easy to produce and use since it is non-toxic abrasive that can be used in place of other scouring agents, and also environmentally friendly families should endeavor to have it.
4. Provide training, resources, and support for local entrepreneurs to produce and market lemon grass deodorant, fostering economic growth, job creation, and self-sufficiency.

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